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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,667	11/29/2007	Gideon P. Stein	1300.0001	6672

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The Law Office of Michael E. Kondoudis  
888 16th Street, N.W.  
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Washington, DC 20006

EXAMINER
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PERUNGAVOOR, SATHYANARAYA V

ART UNIT	PAPER NUMBER
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2624

NOTIFICATION DATE	DELIVERY MODE
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03/30/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

rlynn@mekiplaw.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/599,667	<b>Applicant(s)</b> STEIN ET AL.	
	<b>Examiner</b> SATH V. PERUNGAVOOR	<b>Art Unit</b> 2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/20/07</u> .   | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***Oath/Declaration***

[1] The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

[2] The oath or declaration is defective because: the oath filed on 12/4/2007 fails to claim priority to the PCT/IL 2005/000063 and incorrectly claims priority to an unrelated application 10/952,832.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[3] Claims 1-7, 11, 13, 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. ("Stein") [WO 01/39018 A1] in view of Ohmamyuda et al. ("Ohmamyuda") [US 5,502,432].

Regarding claim 1, Stein discloses the following claim limitations:

A method of estimating a time-to-collision (TTC) of a vehicle with an object

*[abstract]* comprising the step of: (a) acquiring a plurality of images (*i.e.*  $\Psi$  and  $\Psi^f$ ) of

the object at known time intervals (*i.e.*  $\Delta T$ ) between the times at which the images of

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the plurality of images are acquired [page 6, para. 2]; and (b) determining the time-to-collision (TTC) (*i.e. time to contact*) solely from information derived from the images (*i.e. S*) and the time intervals (*i.e.  $\Delta T$* ), wherein said determining the TTC is based on a relative velocity (*i.e. relative speed*) ~~and relative acceleration~~ between the vehicle and the object [pages 6-8].

Stein does not explicitly disclose the following claim limitations (emphasis added):

Determining the TTC is based on a relative velocity and relative acceleration between the vehicle and the object.

However, in the same field of endeavor Ohmamyuda discloses the deficient claim limitations, as follows:

Determining the TTC is based on a relative velocity (*i.e.  $V_r$* ) and relative acceleration (*i.e. G*) between the vehicle and the object [col. 4, ll. 10-20]

Stein and Ohmamyuda are combinable because they are from the same field of collision warning.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein with Ohmamyuda and include relative acceleration when calculating the time of collision, the motivation being to consider activities such as braking which alter time of collision calculation based on relative velocity [col. 4, ll. 60-61].

Regarding claim 2, Stein meets the claim limitations, as follows:

The method according to claim 1, further comprising the step of: (c) determining the relative velocity from the images (*i.e. relative speed* =  $\Delta Z / \Delta T$ ) and using the relative

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velocity to determine TTC (*i.e. deriving eq. 16 based on the relative speed eq. 13*) [pages 7 and 8].

Regarding claim 3, Stein meets the claim limitations, as follows:

The method according to claim 1, wherein said (b) determining the time-to-collision (TTC) includes determining a change in scale of an image of at least a portion of the object (*i.e. S*) and using the change in scale (*i.e. S*) for determining a function (*i.e. eq. 16*) of the relative velocity (*i.e. relative speed*) [pages 7 and 8].

Regarding claim 4, Ohmamyuda meets the claim limitations, as follows:

The method, according to claim 1, further comprising the step of: (c) determining a function of the relative acceleration from the images (*i.e. G*) and using said function of the relative acceleration to determine the TTC (*i.e. Ta*) [col. 4, ll. 10-20; col. 5, ll. 1-10].

Regarding claim 5, Ohmamyuda meets the claim limitations, as follows:

The method according to claim 4, wherein said (c) determining said function of the relative acceleration (*i.e. G*) includes determining a time derivative of a function of the relative velocity (*i.e. eq. 2*) [col. 5, ll. 10].

Regarding claim 6, Stein meets the claim limitations, as follows:

The method according to claim 3, wherein said determining a change in scale includes determining a ratio (*i.e.  $Y_1/Y_2$* ) between a dimension of the object in a first

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one of the images and the same dimension of the object in a second one of the images [page 7].

Regarding claim 7, Stein meets the claim limitations, as follows:

The method according to claim 6, wherein said determining a function of the relative velocity includes determining a function  $T_v = [1/(S-1)]\Delta T$  where S is the ratio and  $\Delta T$  is a time lapse between two images of the images (*i.e. eq. 16*) [page 8].

Regarding claim 11, Stein meets the claim limitations, as follows:

The method according to claim 1, further comprising the step of: (c) determining whether the vehicle and the object are on a course that leads to a collision at the TTC (*i.e. determining whether there is a positive non-infinite time to collision*) [page 8].

Regarding claim 13, Stein meets the claim limitations, as follows:

A system which performs the method steps of claim 1, for determining the time-to-collision (TTC) of the vehicle with the object, the system comprising: (a) at least one camera mounted in the vehicle and adapted for said acquiring of the images (*i.e. camera 13*) [page 2]; and (b) a processor (*i.e. processor 14*) which determines the time-to-collision (TTC) solely from information derived from the images and the time intervals, based on the relative velocity and the relative acceleration between the vehicle and the object (*i.e. see discussion for claim 1*) [page 2].

Regarding claim 14, Stein meets the claim limitations, as follows:

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The system, according to claim 13 wherein the at least one camera is a single camera  
*(i.e. camera 13) [page 2].*

Regarding claim 15, Ohmamyuda meets the claim limitations, as follows:

The system, according to claim 13, further comprising:(c) an alarm apparatus for  
alerting a driver of the vehicle to a possible collision with the object responsive to  
the TTC *[col. 5, ll. 39-43].*

Regarding claim 17, Stein meets the claim limitations, as follows:

The system, according to claim 13, wherein the at least one camera images an  
environment in front of the vehicle *[fig. 1].*

[4] Claims 16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. (“Stein”) [WO 01/39018 A1] in view of Ohmamyuda et al. (“Ohmamyuda”) [US 5,502,432] further in view of Lemelson et al. (“Lemelson”) [US 2004/0022416 A1].

Regarding claims 16, 18 and 19, Stein and Ohmamyuda meet the claim limitations as set forth in claim 13.

Stein and Ohmamyuda do not explicitly disclose the following claim limitations:

16. The system, according to claim 13, further comprising:(c) an alarm apparatus  
which alerts, based on the TTC, at least one person outside of the vehicle to a  
possible collision of the vehicle with the object.

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18. The system, according to claim 13, wherein the at least one camera images an environment in back of the vehicle.

19. The system, according to claim 13, wherein the at least one camera images an environment to a side of the vehicle.

However, in the same field of endeavor Lemelson discloses the deficient claim limitations, as follows:

16. The system, according to claim 13, further comprising: (c) an alarm apparatus which alerts at least one person outside of the vehicle to a possible collision of the vehicle with the object (*i.e. warning the drivers of other vehicles*) [para. 0099].

18. The system, according to claim 13, wherein the at least one camera images an environment in back of the vehicle [para. 0045].

19. The system, according to claim 13, wherein the at least one camera images an environment to a side of the vehicle [para. 0045].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein and Ohmamyuda with Lemelson and employ multiple cameras and provide external alarm signals, the reasoning being that collision can occur due to fault of other vehicles, so monitoring and providing alarms to other drivers avoids such collisions.

[5] Claims 12 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stein et al. ("Stein") [WO 01/39018 A1] in view of Ohmamyuda et al. ("Ohmamyuda") [US 5,502,432] further in view of Narayan et al. ("Narayan") [US 6,317,691 B1].

Regarding claim 12, Stein and Ohmamyuda meet the claim limitations as follows:



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A method according to claim 11, wherein said determining whether the vehicle and object are on a course that leads to a collision at the TTC includes: (ii) determining whether at TTC features straddle at least a part of the vehicle (*i.e. when  $Z=0$* ) [Stein: pages 7-8].

Stein and Ohmamyuda do not explicitly disclose the following claim limitations:

- (i) determining respective motions of at least two features of the object relative to the vehicle from the images.

However, in the same field of endeavor Narayan discloses the deficient claim limitations, as follows:

- (i) determining respective motions of at least two features of the object relative to the vehicle from the images (*i.e. detecting the distance between the vehicles based on the variations (motion) in the apparent distances between the two taillights*) [col. 6].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Stein and Ohmamyuda with Narayan and track taillights to determine distances between the vehicles, the reasoning being avoid the need for a range finder.

Regarding claims 20-24, all claimed limitations are set forth and rejected as per discussion for claims 1-7, 11-15 and 17.

### ***Allowable Subject Matter***

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[6] Claims 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Contact Information***

[7] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Matthew C. Bella whose telephone number is (571) 272-7778, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dated: March 25, 2011

/Sath V. Perungavoor/

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